

Receipt date: 04/21/2009

Application Serial No. 10/587,069

Reply to Office Action of March 4, 2009

PATENT
Docket: CU-4970

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

OK TO ENTER: /SH/

APPLICANT: Naoko SAWATARI et al.) Group Art Unit: 1794

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SERIAL NO: 10/587,069) Examiner: Sow Fun Hon

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FILED: July 21, 2006)

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TITLE: LIQUID CRYSTAL DISPLAY

Mail Stop Amendment

THE COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, VA 22313-1450

SUPPLEMENTAL AMENDMENT

Sir:

This is in response to the Office Action dated March 4, 2009, and having a shortened statutory period for reply set to expire on June 4, 2009. Applicant submits the following supplemental amendment in the above-identified application. Applicant believes this supplemental amendment places the application in better condition for allowance.

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

Amendments to the Claims

The listing of claims presented below replaces all prior versions, and listings, of claims in the application.

Listing of claims:

1-10. (canceled)

11. (currently amended) A liquid crystal display comprising a ferroelectric liquid crystal layer sandwiched between two substrates,

wherein an electrode and a photo alignment layer are each successively formed on opposite faces of the two substrates facing each other;

wherein a constituent material of the respective photo alignment layer is a photoreactive material which generates a photoreaction to give anisotropy to the photo alignment layer, the photoreaction of the constituent material of one respective photo alignment layer being a photo-dimerization reaction; and

the constituent material of the respective photo alignment layer has a different composition from each other with the ferroelectric liquid crystal layer sandwiched therebetween; and

wherein [[the]] a ferroelectric liquid crystal in the ferroelectric liquid crystal layer is a liquid crystal: having no smectic A phase in a phase series thereof, exhibiting mono-stability and undergoing half-V-shaped driving; and

further wherein the ferroelectric liquid crystal forms mono-domain alignment in the ferroelectric liquid crystal layer.

12. (previously presented) The liquid crystal display according to claim 11, wherein the photoreaction of the constituent material of the other respective photo alignment layer is a photo-dimerization reaction or a photo decomposition reaction.

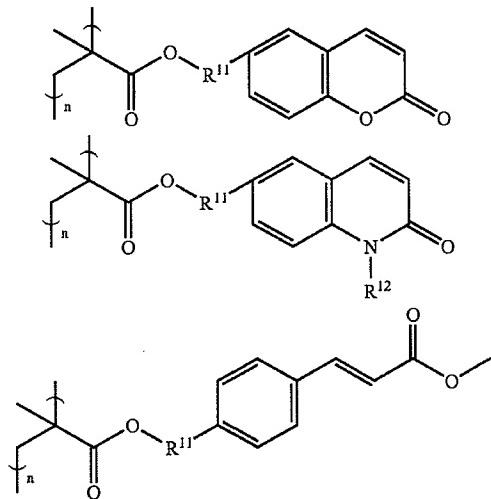
13. (previously presented) The liquid crystal display according to claim 11, wherein the photoreactive material comprises a photo-dimerization-reactive compound having a radical-polymerizable functional group and dichroism that different absorptivities are exhibited depending on a polarization direction thereof.

14. (previously presented) The liquid crystal display according to claim 12, wherein the photoreactive material comprises a photo-dimerization-reactive compound having a radical-polymerizable functional group and dichroism that different absorptivities are exhibited depending on a polarization direction thereof.

15. (previously presented) The liquid crystal display according to claim 13, wherein the photo-dimerization-reactive compound is a dimerization-reactive polymer containing, as its side chain, any one of cinnamic acid ester, coumarin, and quinoline.

16. (previously presented) The liquid crystal display according to claim 14, wherein the photo-dimerization-reactive compound is a dimerization-reactive polymer containing, as its side chain, any one of cinnamic acid ester, coumarin, and quinoline.

17. (previously presented) The liquid crystal display according to claim 13, wherein the photo-dimerization-reactive compound is at least one selected from dimerization-reactive polymers represented by the following formulae:

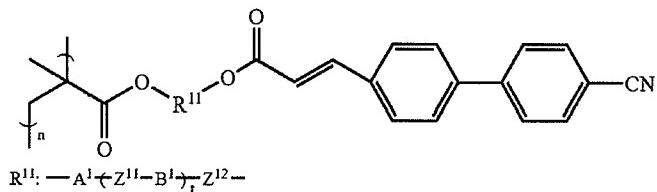


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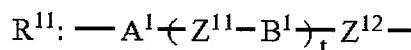
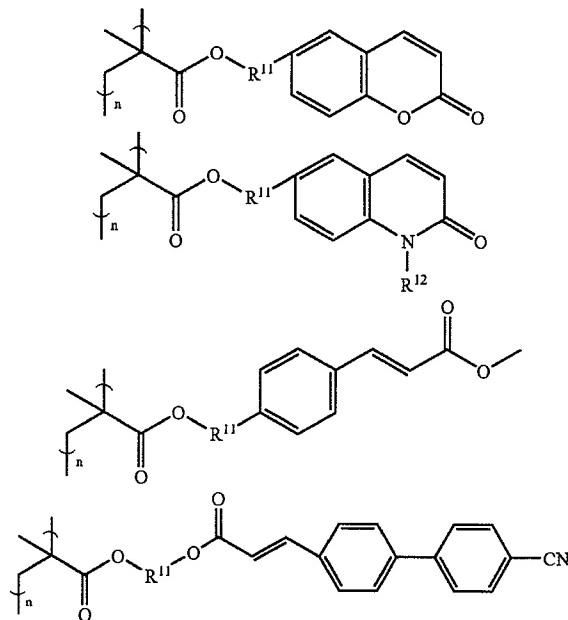
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in which A^1 and B^1 : 1,4-phenylene, a covalent single bond, pyridine-2,5-diyl, pyrimidine-2,5-diyl, 1,4-cyclohexylene or 1,3-dioxane-2,5-diyl;
 Z^{11} and Z^{12} : $-\text{CH}_2-\text{CH}_2-$, $-\text{COO}-$, $-\text{OOC}-$, or a covalent single bond;
 t : an integer of 0 to 4;
 R^{12} : a lower alkyl; and
 n : an integer of 4 to 30,000.

18. (previously presented) The liquid crystal display according to claim 15, wherein the photo-dimerization-reactive compound is at least one selected from dimerization-reactive polymers represented by the following formulae:



in which A^1 and B^1 : 1,4-phenylene, a covalent single bond, pyridine-2,5-diyl,

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pyrimidine-2,5-diyl, 1,4-cyclohexylene or 1,3-dioxane-2,5-diyl;
 Z^{11} and Z^{12} : —CH₂—CH₂—, —COO—, —OOC—, or a covalent single bond;

t: an integer of 0 to 4;

R¹²: a lower alkyl; and

n: an integer of 4 to 30,000.

19. – 22. (cancelled)

23. (previously presented) The liquid crystal display according to claim 11, wherein the ferroelectric liquid crystal is a liquid crystal which constitutes a single phase.

24. (previously presented) The liquid crystal display according to claim 12, wherein the ferroelectric liquid crystal is a liquid crystal which constitutes a single phase.

25. (previously presented) The liquid crystal display according to claim 11, wherein the liquid crystal display is driven by an active matrix system using a thin film transistor.

26. (previously presented) The liquid crystal display according to claim 12, wherein the liquid crystal display is driven by an active matrix system using a thin film transistor.

27. (previously presented) The liquid crystal display according to claim 11, wherein the liquid crystal display is displayed by a field sequential color system.

28. (previously presented) The liquid crystal display according to claim 12, wherein the liquid crystal display is displayed by a field sequential color system.

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REMARKS

In the Office Action, dated March 4, 2009, the Examiner states that Claims 11-18 and 23-28 are allowed. By the present Amendment, Applicant amends Claim 1.

The claims presented above take into account the Examiner's amendment recited in the Office Action dated March 4, 2009. However, Applicant considers that a further amendment, as indicated above in Claim 1, may be necessary in order to further clarify the claimed subject matter. Applicant respectfully requests the Examiner's acceptance of the amendment to Claim 1.

In light of the foregoing response, all the outstanding objections and rejections are considered overcome. Applicant respectfully submits that this application should now be in condition for allowance and respectfully requests favorable consideration.

Respectfully submitted,

April 21, 2009

Date



Attorney for Applicant
Eric D. Babych
c/o Ladas & Parry LLP
224 South Michigan Avenue
Chicago, Illinois 60604
(312) 427-1300
Reg. No. 57,542